

II. CLAIMS

1. (Currently amended) A method for implementing fast signalling in a communication connection between a base station and a mobile station of a cellular radio network, comprising the steps of:

- defining an arrangement of repeatedly occurring frames that consist of pieces of allocatable radio communication capacity between the base station and mobile stations communicating therewith,
- allocating pieces of radio communication capacity from the arrangement of repeatedly occurring frames to dedicated communication channels,
- allocating a piece of radio communication capacity from the arrangement of repeatedly occurring frames to a non-dedicated fast signalling channel, and
- using said piece of radio communication capacity allocated to a non-dedicated fast signalling channel for conveying fast signalling feedback messages between at least one mobile station and the base station, wherein the messages describe estimated phase differences between signals received from plural transmission antennas that carry feedback concerning an ongoing communication on a dedicated communication channel between at least one mobile station and the base station.

2. (Original) A method according to claim 1, wherein the step of allocating a piece of radio communication capacity from the arrangement of repeatedly occurring frames to a non-dedicated fast signalling channel comprises the step of allocating a piece of

radio communication capacity from the arrangement of repeatedly occurring frames to a completely non-dedicated fast signalling channel, so that all mobile stations communicating with said base station are equally allowed to use said non-dedicated fast signalling channel.

3. (Original) A method according to claim 1, wherein the step of allocating a piece of radio communication capacity from the arrangement of repeatedly occurring frames to a non-dedicated fast signalling channel comprises the step of allocating a piece of radio communication capacity from the arrangement of repeatedly occurring frames to a virtually non-dedicated fast signalling channel, so that a well-defined subgroup of all mobile stations communicating with said base station are mutually equally allowed to use said non-dedicated fast signalling channel.

4. (Original) A method according to claim 3, comprising the step of announcing by the base station to a mobile station, into which subgroup of all mobile stations communicating with said base station the mobile station belongs.

5. (Original) A method according to claim 1, wherein the step of using said piece of radio communication capacity allocated to a non-dedicated fast signalling channel for conveying fast signalling messages comprises the substep of using a multiple access arrangement to separate fast signalling transmissions relating to several mobile stations from each other.

6. (Original) A method according to claim 5, comprising the step of separating fast signalling transmissions relating to several mobile stations from each other through frequency division multiple access.

7. (Original) A method according to claim 5, comprising the step of separating fast signalling transmissions relating to several mobile stations from each other through time division multiple access.

8. (Original) A method according to claim 5, comprising the step of separating fast signalling transmissions relating to several mobile stations from each other through code division multiple access.

9. (Original) A method according to claim 5, comprising the step of separating fast signalling transmissions relating to several mobile stations from each other through a combination of at least two of frequency division multiple access, time division multiple access and code division multiple access.

10. (Original) A method according to claim 1, wherein the step of using said piece of radio communication capacity allocated to a non-dedicated fast signalling channel for conveying fast signalling messages comprises the substep of transmitting a fast signalling message where a training sequence is accompanied by at least one information symbol additional to the training sequence.

11. (Original) A method according to claim 1, wherein the step of using said piece of radio communication capacity allocated to a non-dedicated fast signalling channel for conveying fast signalling messages comprises the substep of transmitting a fast signalling message where a training sequence is accompanied by at least information symbol that replaces a part of the training sequence.

12. (Original) A method according to claim 1, wherein the step of using said piece of radio communication capacity allocated to a non-dedicated fast signalling channel for conveying fast signalling messages comprises the substep of transmitting a fast signalling message where a training sequence is selected from a number of alternative training sequences in order to convey a piece of information through the selection of a particular training sequence.

13. (Original) A method according to claim 1, comprising the steps of:

- allocating several differently located pieces of radio communication capacity from the arrangement of repeatedly occurring frames to non-dedicated fast signalling channels in the communication direction from the mobile stations to the base station and
- allowing mobile stations to choose among said allocated pieces of radio communication capacity allocated to non-dedicated fast signalling channels in order to enable conveying fast signalling messages from the mobile stations to the base station in a way that is convenient to each mobile station.

14. (Original) A method according to claim 1, comprising the steps of:

- examining, whether a part of an existing dedicated communication connection between the mobile station and the base station is available for conveying fast signalling messages between said mobile station and the base station and
- only if such a part of an existing dedicated communication connection between the mobile station and the base station is not found to be available for conveying fast signalling messages between said mobile station and the base station, implementing the step of using said piece of radio communication capacity allocated to a non-dedicated fast signalling channel for conveying fast signalling messages between said mobile station and the base station.

15. (Original) A method according to claim 1, comprising the steps of:

- examining, whether a part of an existing dedicated communication connection between the mobile station and the base station is available for conveying fast signalling messages between said mobile station and the base station and
- only if such a part of an existing dedicated communication connection between the mobile station and the base station is not found to be available for conveying all required fast signalling messages between said mobile station and the base station, implementing the step of using said piece of radio communication capacity allocated to a non-dedicated fast signalling channel for conveying those fast signalling messages between said mobile station and the base station for which no part of an existing dedicated communication connection was found to be available.

16. (Currently amended) A mobile station of a cellular radio network, comprising:

- means for setting up communication connections between it and base stations of the cellular radio network,
- means for observing an arrangement of repeatedly occurring frames that consist of pieces of allocatable radio communication capacity between the base station and mobile stations communicating therewith,
- means for locating such a piece of radio communication capacity within the arrangement of repeatedly occurring frames which is allocated to a non-dedicated fast signalling channel, and
- means for utilising said piece of radio communication capacity allocated to a non-dedicated fast signalling channel by transmitting or receiving fast signalling feedback messages between at least one mobile station and the base station, wherein the messages describe estimated phase differences between signals received from plural transmission antennas that carry feedback concerning an ongoing communication on a dedicated communication channel to or from said base station.

17. (Original) A mobile station according to claim 16, comprising:

- means for examining, whether a part of an existing dedicated communication connection in the communication direction from the mobile station to the base station is available for conveying fast signalling messages from said mobile station to the base station and
- means for utilising such a part of an existing dedicated communication connection, if found to be available, by transmitting fast signalling messages to said base station, and only utilising said piece of radio communication capacity allocated to

a non-dedicated fast signalling channel by transmitting fast signalling messages to said base station is no part of an existing dedicated communication connection was found to be available.

18. (Original) A mobile station according to claim 16, comprising:

- means for examining, whether a part of an existing dedicated communication connection in the communication direction from the mobile station to the base station is available for conveying at least some fast signalling messages from said mobile station to the base station and
- means for utilising such a part of an existing dedicated communication connection, if found to be available, by transmitting fast signalling messages to said base station, and only utilising said piece of radio communication capacity allocated to a non-dedicated fast signalling channel by transmitting those fast signalling messages to said base station for which no part of an existing dedicated communication connection was found to be available.

19. (Currently amended) A base station of a cellular radio network, comprising:

- means for setting up communication connections between it and mobile stations of the cellular radio network,
- means for setting up an arrangement of repeatedly occurring frames that consist of pieces of allocatable radio communication capacity between the base station and mobile stations communicating therewith,

- means for indicating such a piece of radio communication capacity within the arrangement of repeatedly occurring frames which is allocated to a non-dedicated fast signalling channel and
- means for utilising said piece of radio communication capacity allocated to a non-dedicated fast signalling channel by receiving or transmitting fast signalling feedback messages between at least one mobile station and the base station, wherein the messages describe estimated phase differences between signals received from plural transmission antennas that carry feedback concerning an ongoing communication on a dedicated communication channel from or to at least one mobile station.

20. (Currently amended) An apparatus for implementing fast signalling in a communication link of a cellular radio network, the apparatus comprising:

- a transmitter of a signal having an arrangement of repeatedly occurring frames defining pieces of allocatable radio communication capacity between stations of the network;
- a controller allocating pieces of radio communication capacity from the arrangement of repeatedly occurring frames to dedicated communication channels of the network, the controller further allocating a piece of radio communication capacity from the arrangement of repeatedly occurring frames to a non-dedicated fast signalling channel of the network; and
- wherein said piece of radio communication capacity allocated to a non-dedicated fast signalling channel serves for conveying fast signalling feedback between at least one mobile station and the base station, wherein the messages describe

estimated phase differences between signals received from plural transmission antennas ~~messages that carry feedback concerning an ongoing communication on one of said dedicated communication channels between said stations of the network.~~

21. (Currently amended) A method comprising:

- implementing fast signalling in a communication connection between stations of a cellular radio network;
- defining an arrangement of repeatedly occurring frames that consist of pieces of allocatable radio communication capacity between said stations of the network;
- allocating pieces of radio communication capacity from the arrangement of repeatedly occurring frames to dedicated communication channels of the network;
- allocating a piece of radio communication capacity from the arrangement of repeatedly occurring frames to a non-dedicated fast signalling channel of the network; and
- using said piece of radio communication capacity, allocated to the non-dedicated fast signalling channel, for conveying fast signalling feedback messages between at least one mobile station and the base station, wherein the messages describe estimated phase differences between signals received from plural transmission antennas ~~that carry feedback concerning an ongoing communication on one of the dedicated communication channels between said network stations.~~

22. (Currently amended) A computer ~~program-product-readable medium storing a computer program~~ for implementing fast signalling in a communication link of a cellular radio network, the computer program product including a storage media for storing steps of a program for implementing fast signalling in a communication link between stations of a cellular radio network, the program steps comprising:

- defining an arrangement of repeatedly occurring frames that consist of pieces of allocatable radio communication capacity between said stations of the network;
- allocating pieces of radio communication capacity from the arrangement of repeatedly occurring frames to dedicated communication channels of the network;
- allocating a piece of radio communication capacity from the arrangement of repeatedly occurring frames to a non-dedicated fast signalling channel of the network; and
- using said piece of radio communication capacity, allocated to the non-dedicated fast signalling channel, for conveying fast signalling feedback messages that carry feedback concerning an ongoing communication on one of the dedicated communication channels between said network stations, wherein the messages describe estimated phase differences between signals received from plural transmission antennas.

23. (New) A method for implementing fast signalling in a communication connection between a base station and a mobile station of a cellular radio network, comprising the steps of:

defining an arrangement of repeatedly occurring frames that consist of pieces of allocatable radio communication capacity between the base station and mobile stations communicating therewith,

allocating pieces of radio communication capacity from the arrangement of repeatedly occurring frames to dedicated communication channels,

allocating a piece of radio communication capacity from the arrangement of repeatedly occurring frames to a non-dedicated fast signalling channel, and

using said piece of radio communication capacity allocated to a non-dedicated fast signalling channel for conveying fast signalling messages between at least one mobile station and the base station by transmitting a fast signalling message with a training sequence,

wherein the training sequence is accompanied by at least one information symbol additional to the training sequence, or the training sequence is accompanied by at least information symbol that replaces a part of the training sequence, or the training sequence is selected from a number of alternative training sequences in order to convey a piece of information through the selection of a particular training sequence.